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Science and Technology Perspectives

S&T DEVELOPMENTS:

- New Accelerator** (PRC) China has completed its first large-scale accelerator project, according to a 10 May report. Costing some 50 million yuan, the facility occupies 8,300m² and has a peak power capacity of 13 MeV. The accelerator is ideally suited to investigate light particle and heavy ion reactions, nuclear spin, and heavy ion fusion. STAT
- Electronics** (Hungary) TKI (Telecommunications Research Institute) is developing both Gunn diode and transistorized YIG-tuned oscillators. Several types which function well in the 1-12 GHz frequency band have been developed at the institute. STAT

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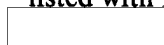
S&T ARTICLES:

- USSR: Several Oceanographic Studies Relate to Shallow Seas** Page 3
Recent articles on shallow sea experiments suggest a new emphasis in Soviet oceanographic research.
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- Brazil: Talks With Bloc Focus on Fiber Optics, Technology Transfer**..... Page 6
On the decline for five years, Brazilian-Soviet trade is expanding with the sale of licenses and technologies on both sides and the creation of joint enterprises and ventures.
- Japan: Soviet Nuclear Plant Accident May Dampen Reactor Construction** Page 7
Japanese nuclear reactor manufacturers fear that the Chernobyl accident may slow down nuclear reactor development and sales in both the domestic and world markets. The Japanese hope to raise the facility operating rate to 90 percent to take care of 35 percent of their power needs by 1995.
- Japan: Activities Promote Research Exchange** Page 9
The Japanese Government has recently initiated several research exchange programs to minimize its dependence on foreign technology.
- Japan: Automobile Parts Manufacturers Encouraged To Locate Plants in the United States** Page 10
Many Japanese auto parts manufacturers find locating their factories in the United States more attractive because they are losing cost advantages over their U.S. counterparts and because of price cuts demanded by Japanese automakers.

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S&T DEVELOPMENTS highlights worldwide S&T events in the foreign media. Items followed by an asterisk will be published by FBIS. Contributors' initials and extensions also are provided.

Computers

(Hungary) By the end of the current plan period, the Videoton Computer Factory expects to produce merchandise worth 12 billion forints. Selection will be broadened especially in the field of microcomputers and peripherals. New products will include the VT-8 (the so-called TV Computer), the VT-8/16 personal computer, and the VT-16/32, which performs as a desktop computer. All three types will have graphics capability. []

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Factory Automation

(Hungary) A control system for a "Beta" robot has been developed by the Tungsram Company of Hungary. The universal control system was designed for the Soviet automobile industry. Although the robot will be used chiefly for welding, it can also assemble and load. Seventy "Beta" control systems will be shipped to the USSR this year and over 1,000 have been ordered through 1990. Each system costs nearly 1 million forints. []

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Production Process

(USSR) A Gosplan official has recommended reorganizing the machinebuilding sector's unwieldy production structure. To satisfy the projected volume demand for standardized, low-cost, high-quality parts and components of producer durables, the official recommends that specialized, highly automated plants be established to serve as reliable subcontractors to the larger, centrally located machinebuilding enterprises. []

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Crystal Growth

(PRC) KTP (potassium titanyl phosphate) crystals recently developed by the Crystal Materials Research Institute of Shandong University will be exported to Japan. Samples of these crystals, which have various laser applications, were tested by Japan Vacuum Technology Company and found to be superior to similar U.S. products. []

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Ariane

(France) On 6 May Arianespace obtained a contract to launch two Japanese Space Communications Corporation satellites into orbit in 1988. []

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FOR OFFICIAL USE ONLY**Airbus**

(France) Twelve French banks have signed an agreement with Aerospatiale to partially finance the development of the Airbus A 320. The Fr 400 million loan will be repaid by deductions (2 percent of the selling price) from monies received upon delivery of each aircraft. Paribas is the leader of the operation and holds 24 percent of the loan. [REDACTED]

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ESPRIT

(EC) The European Commission has invited tenders to finance new projects for the ESPRIT program. An available 62 million ECU will be divided among four fields of activity: microelectronics (17 million ECU), software technology (16 million ECU), advanced data processing (17 million ECU), and computer integrated manufacturing (12 million ECU). [REDACTED]

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Megaproject

(Netherlands) The European Investment Bank has promised Philips a F1 400 million loan for the Megaproject (the Philips-Siemens joint venture to develop a new generation of memory chips). The loan will cover part of the construction costs of a new computer laboratory. [REDACTED]

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Technology Transfer

(FRG) As part of its participation in SDI, the FRG Government plans to introduce compulsory company licensing for the sale of embargoed technologies to certain countries. Applications of COCOM embargoes will be tightened, controls and punishments for violations clarified, and the rules for third-country transactions with embargoed goods changed. [REDACTED]

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(France/PRC) Under the sponsorship of France's CNET-Grenoble (National Center for Telecommunications Studies), a center for the design of VLSI circuits will be set up in the PRC near Shanghai. This is expected to clear the way for negotiations for new orders of telecommunications equipment. The agreement also involves a production line for 2-micron VLSI-MOS circuits. [REDACTED]

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USSR: SEVERAL OCEANOGRAPHIC STUDIES RELATE TO SHALLOW SEAS

Key Points: Current Soviet scientific journals include several articles reporting on various phenomena that occur in shallow seas. These articles may indicate a new emphasis in Soviet oceanographic research.

Recent discussions in Soviet publications pertain to the acoustics of shallow seas. Associates of the Acoustics Institute imeni N. N. Andreyev have published two articles on shallow sea acoustics recently. One author employed the Pekeris shallow sea model in his research, proposing a method of detecting normal waves in a uniform-speed waveguide with the aid of a vertical linear antenna. This method consists of fixed signal processing based on the repeated reflection of the sound field and antenna apertures relative to the boundaries of the water layer. (1)

According to the other article from the Acoustics Institute, the presence of a maximum in the frequency dependence of sound attenuation can be explained by the existence of a thin near-surface water-saturated layer of sediment, in which the longitudinal sound speed is less than the sound speed in the layer above. Thus, the resonant behavior of the attenuation coefficient in the existence of a benthic sound channel provides data applicable to determination of the velocity characteristics of the upper sedimentary layer. (2)

In another report involving shallow sea acoustics, an affiliate of the Applied Physics Institute presents a computation showing the capability of experimentally determining the dispersion characteristics of several types of waveguides. He uses a two-layer waveguide in which seven modes are excited. He states that it is easiest to solve the modes in a shallow sea where the number of modes is small. As a result, there is sufficient distance between adjacent modes. (3)

Members of the Radiophysics Faculty of the Gorkiy State University imeni N. I. Lobachevskiy demonstrate in their report the necessity to take bottom stratification into account. Using the scale physical modeling method, they analyze the influence of the parameters of the ocean bottom and the negative gradient of sound velocity in a water layer on the regularity of low-frequency sound propagation. (4) A paper from Rostov State University imeni M. A. Suslov concentrates on evaluating the maximum possible field levels in the sound focusing zones with a positioning of the transducers (signal source and detector) near the boundary surfaces and at the center of the water layer. (5)

N. S. Speranskiy of the Oceanology Institute imeni P. P. Shirshov contributed a recent article on waves in shallow seas and co-authored an earlier one. Speranskiy categorizes wave velocity field deformation as linear and nonlinear. He states that linear deformation is characterized by an increase in the density of the energy flow without a change in the frequency structure of the wave movement, whereas the essence of nonlinear deformation is in the change of the frequency structure of the field, according to the increase of higher harmonic energy. He reports that nonlinear deformation prevails nearer shore, where the width of the zone of nonlinear deformation stays within 10-20 percent of the width of the shore area, is directly dependent on wave height, and is inversely dependent on wave steepness and bottom slope. (6)

In his earlier work with his colleague, Speranskiy establishes that sand particles are transported horizontally at the Stokes velocity for the transport of water in a wave. The authors note that the reduction in speed for the deposit of solid particles does not exceed 5 percent of the magnitude of their sinking velocity. The basic mechanisms for supporting the sand particles appear to involve wave irregularity and turbulence. (7)

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Publications on waves in shallow seas could contribute to other fields. For example, an article on tsunami waves in shallow seas submitted by the Marine Geology and Geophysics Institute presents equations which depict in full the change in parameters of periodic waves against a flat sloping bank as a function of depth and slope. In addition, it includes nomograms which would aid designers of hydraulic engineering projects and coastal protection structures in locations susceptible to tsunamis. (8)

The references for the above information are as follows:

1. "Detection of Normal Waves in a Shallow Sea Using a Vertical Linear Antenna" (AKUSTICHESKIY ZHURNAL, January-February 1986)
2. "The Frequency Dependence of the Sound Field Attenuation Coefficient in a Shallow Sea" (Ibid.)
3. "A Method of Determining the Dispersion of Modes in a Shallow Sea" (Ibid.)
4. "An Experimental Study of Sound Field Structure in a Shallow Sea Using a Physical Model" (Ibid.)
5. "Weakening of Interference Peaks in the Acoustic Field in a Shallow Sea" (Ibid., September-October 1985)
6. "Two Types of Deformation of Wave Velocity Field in the Nearshore Region" (OKEANOLOGIYA, November-December 1985)
7. "A Calculation of the Movement of Suspended Sand Particles in a Monochromatic Wave in Shallow Water" (Ibid., September-October 1985)
8. "Run-up and Transformation of Tsunami Waves in Shallow Water" (METEOROLOGIYA I GIDROLOGIYA, October 1985)

(Translations or abstracts of the above appear in USSR REPORT: EARTH SCIENCES.)



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HUNGARY: SURFACE MOUNTING TECHNOLOGY (SMT) TO LOWER IC COSTS

Key Points: The adoption of Surface Mounting Technology by two major producers of ICs—the REMIX Radio Engineering Factory and the Microelectronics Enterprise—is imminent, according to IMPULZUS (No 7, Apr 86). The paper argues that Hungary's "ample" experience in producing printed and hybrid circuits affords a sound basis for adopting SMT.

The cost of ICs depends largely on the manner in which components are assembled, IMPULZUS explains. In countries where surface mounting has been adopted, the price of ICs is already 30 to 70 percent lower than that of conventionally assembled printed circuits. SMT is economical, since it requires fewer printed circuits and less soldering material. Moreover, the process can be used in conjunction with conventional assembly, thus allowing its gradual integration.

The REMIX Radio Engineering Enterprise will be the first Hungarian company to have an SMT plant, REMIX officials told IMPULZUS. Orders dispatched in early 1985 for the necessary automatic equipment were filled and accompanied by the designing system that same year. Prompt equipment delivery reportedly was due to financial support from the National Technical Development Committee, which provided funds amounting to 30 million forints (including convertible foreign exchange), and to good working relations between Sicontact Mixed Enterprise of REMIX and Siemens contractors.

A pilot plant should become operational in the third quarter of this year. According to officials, the plant will develop SMT know-how that will be made available to local firms planning to adopt this technology. In addition, the plant will design and fabricate at no charge prototypes to meet customer specifications, thereby reducing the risk to the customer. The plant will have a capacity of 3,000 to 4,000 elements per hour and will serve as a working model to be further refined by design engineers. REMIX will contribute 20-30 million forints toward its establishment. REMIX reportedly is seeking opportunities to cooperate with large appliance manufacturers who could incorporate such circuitry in their products.

Using SMT and capable of producing approximately 2,000 elements per hour, a second pilot plant will "soon" become operational at the Microelectronics Enterprise, Hungary's largest producer of ICs, IMPULZUS reports. The paper echoes industry rumors that Videoton, Orion, and the Communications Technology Cooperative will follow with their own pilot plants. The paper also notes that flexible, readily convertible designing and implanting production lines of small and medium capacity will be used to meet the needs of producers who are short of capital.

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FOR OFFICIAL USE ONLY**BRAZIL: TALKS WITH BLOC FOCUS ON FIBER OPTICS, TECHNOLOGY TRANSFER**

Key Points: A series of recent Brazilian trade overtures to Warsaw Pact countries, some in areas involving technology transfer, reflect a more aggressive export posture and technological exchange approach than previously observed in Brazilian press reports.

An indication of increased technological exchange lies in the proposed Brazilian-Soviet accord to sell 1,500 kilometers of fiber optic cable over a four-year period. The accord, to be signed shortly according to O ESTADO DE SAO PAULO of 1 April, is an outgrowth of the First Individual Brazilian Exhibit held in the USSR in October 1985. TELEBRAS (Brazilian Telecommunications Inc) displayed their most recent advances in telecommunications and informatics technology at that exhibit. The fiber optic cable, Brasilia's CORREIO BRAZILIENESE of 27 March said, was manufactured domestically with technology from the TELEBRAS Research and Development Center in Campinas, Sao Paulo State. The accord provides for the immediate sale by the Brazilian firm ABC X-Tal of 56 kilometers of submarine optic cable to the Soviet Government, out of an initial 400-kilometer lot to be delivered during the next two years. The agreement, negotiated by technicians of the East European Commission of the Brazilian Foreign Affairs Ministry, also involves other socialist countries that participated in the 1985 industrial fair, all members of CEMA. According to O ESTADO DE SAO PAULO of 1 April, as a result of Brazil's participation in the upcoming Fourth International Communications Fair in the USSR from 27 May to 4 June, the telecommunications and informatics sector should garner a good part of the \$2 billion that the USSR plans to invest in office automation during 1986.

Interest in the purchase of fiber optics was also expressed by a Czech delegation visiting Brazil in late January 1986 to negotiate an increase in bilateral trade, O ESTADO DE SAO PAULO of 23 January reported. The delegation specifically expressed a desire to purchase Brazilian fiber optics and laser technology in exchange for several million dollars' worth of irrigation equipment for the Brazilian Nordeste Project.

A GDR-sponsored "technical week" to be held in five Brazilian cities from 27 to 29 May is designed to offer new trade prospects in advanced technology, GAZETA MERCANTIL of 1 April reported. The "technical week," in collaboration with the Sao Paulo State Federation of Industries, will focus on four main themes: machine tools, technology for coal exploration, consumer durables, and bilateral trade. GAZETA MERCANTIL also cited a 3 February agreement with the GDR firm Carl Zeiss-Jena for Brazilian production of optical glass in a Minas Gerais pilot plant, under license, with GDR technology. The entire line of optical glass consists of 16 specific items to be used by three Brazilian firms. Carl Zeiss-Jena General Director Hans-Ludwig Erlenbeck noted that this is the first time that technology to produce optical glass is being provided to a foreign associate and that the contract marks the beginning of a new phase in relations with Brazil.

Yugoslavia will be Brazil's first East European partner in arms production according to O ESTADO DE SAO PAULO of 17 January 1986, quoting JANE'S DEFENSE WEEKLY. O ESTADO, quoting further, said that Belgrade, in partnership with Brazil, wants to produce a tank turret with a 120-mm cannon and laser range finder made by the Soviets. The Brazilian Army, according to JANE'S DEFENSE WEEKLY, considers the project an opportunity for technological cooperation. The Brazilian Foreign Affairs Ministry, the magazine adds, sees it as a possibility for equalizing the balance of trade, while the military industry views it as a possibility for close study of Soviet technology, O ESTADO concludes.

(A translation of the sources cited in this article will appear in LATIN AMERICA REPORT.)



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DAMPEN REACTOR CONSTRUCTION**

Key Points: Recent Tokyo press reports indicate that Japanese nuclear reactor manufacturers are concerned that the Chernobyl accident may have a negative impact on domestic nuclear power construction and on the nuclear reactor export market. To expand the market, the industry is proposing that the government relax nuclear regulations; at the same time, other groups are raising questions about safety and liability in case of an accident.

NIHON KEIZAI SHIMBUN of 1 May reports that Japan's nuclear power industry fears that the Chernobyl accident may stir up public opinion against the future use of nuclear reactors and retard the growth of both the domestic and world nuclear reactor markets. NIHON KEIZAI SHIMBUN OF 2 May reports that Japanese nuclear reactor manufacturers have been making a great effort to provide developing countries, including Korea and China, with information and educational programs on nuclear power, hoping to sell reactors to them in the future.

NIHON KEIZAI SHIMBUN of 1 May reports that Japan has demonstrated a fine safety record in nuclear power plant operation, and that the role of nuclear power is growing in Japan. The press says that the Ministry of International Trade and Industry (MITI) recently disclosed that the facility operating rate reached 76 percent in FY85, the highest on record. MITI also reported that nuclear power output amounted to 27 percent of Japan's entire electricity output of 516.5 billion kilowatt-hours during the past fiscal year. MITI hopes to raise the facility operating rate to 90 percent to take care of 35 percent of Japan's power needs by 1995, according to NIHON KEIZAI SHIMBUN of 1 and 2 May.

According to NIHON KEIZAI SHIMBUN of 3 May, the Japan Atomic Energy Forum (JAEF), whose members are power companies and nuclear reactor manufacturers, is eager to seek government support in order to establish itself in the future world market. Despite the Chernobyl accident, the organization has just suggested a relaxation in existing regulations. JAEF claims that, in order to provide economic incentives for nuclear power plant construction, a less stringent inspection program is desirable. The organization also suggests that the government establish promotional measures for international cooperation on nuclear power generation in order to nurture the world market for Japan. JAEF officials say that Japanese safety standards are excessively stringent and a slight relaxation would not jeopardize public safety.

As NIHON KEIZAI SHIMBUN of 2 May reports, the Japanese nuclear industry is also trying to minimize the negative effect of the Chernobyl accident and to emphasize the differences in technology between Japanese and Soviet reactors. The source says that the Chernobyl light-water reactor (LWR) is graphite-moderated water-cooled while Japanese LWRs are water-cooled. The source says that there are 32 nuclear power reactors in operation in Japan. They consist of one gas-cooled reactor (GCR), 16 boiling-water reactors (BWRs), and 15 pressurized-water reactors (PWRs). Ten new reactors, which are BWRs and PWRs, are under construction. The press also says that the Japanese are proud of their high safety standards and inspection practices. Japan's Electric Power Regulations stipulate that each nuclear power plant must inspect about 70 items at each facility, which results in plant shutdowns of three to four months per year.

According to NIHON KEIZAI SHIMBUN of 3 May, however, the Japan Federation of Lawyers has raised questions about the handling of nuclear materials, fuels, and nuclear power plants. The organization expressed a number of concerns, claiming that the government is exempting the nuclear industry from legal responsibility in case of an accident, while government responsibility is also ambiguous. These questions have been raised with the Science and Technology Committee of both the

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upper and lower houses, and with the Science and Technology Agency in order to influence revision of the nuclear power draft law currently under deliberation in the Diet.

(A translation of the sources cited in this article will appear in JAPAN REPORT: SCIENCE AND TECHNOLOGY).



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JAPAN: ACTIVITIES PROMOTE RESEARCH EXCHANGE

Key Points: The Tokyo press has reported recently on several developments designed to implement policies that will promote indigenous creative basic research efforts and research exchange. Through these measures Japan expects to lessen its dependence on technology imports and hopes to deflect criticism resulting from overseas trade problems.

According to KAGAKU KOGYO NIPPO on 3 March and NIHON KEIZAI SHIMBUN on 6 April, the Japanese Government is planning to establish in May an international organization to promote joint research in basic science and technology. Two specific programs have been formulated to implement this idea: MITI's "Human Frontier Program" and the Science and Technology Agency's "Human and Earth Science Plan." The stated goal of both projects is to contribute to the internationalization of basic research and ease some of Japan's trade friction problems. Research under the MITI proposal will focus on biological function-application technology (bionics, biomimesis) while that of the STA will revolve around the themes of gene data, life ethics, and abnormal weather phenomena. According to the KAGAKU KOGYO NIPPO, both programs want to procure 1 trillion yen for research over the next 10 years.

YOMIURI SHIMBUN on 18 February reports that the Research Exchange Promotion Bill (tentative name), which the government wants to submit to the current session of the Diet, has been made public. The bill would allow foreign researchers to be employed at national research institutes (NRIs), which have been closed to foreigners until now. The international exchange of NRI researchers will begin in earnest in the next fiscal year using funds from the Account for Promoting Science and Technology Adjustment. According to KAGAKU KOGYO NIPPO on 17 March, a budget of 1.4 billion yen, double this fiscal year's appropriation, has been approved for important basic research at NRIs. One hundred million yen of this amount is earmarked for expenses to send Japanese researchers to international symposia and to invite foreign researchers to NRIs.

In addition, the Japan Trust Program for International Research Cooperation (Japan Trust) was launched in fiscal year 1985 by the Key Technology Center. According to the January edition of KOGYO GIJUTSU, the Japan Trust was set up to invite world class researchers to Japan to reciprocate for the many Japanese researchers foreign countries have accepted in the past. The government hopes that these invitations to foreign researchers, who may generate novel ideas born of different cultural heritages, will help Japan develop the autonomous technology important to a small, natural resource-deficient country. The program will provide foreign researchers with funds to cover round-trip air fare to Japan, travel costs to research institutes and symposia within the country, and living expenses.

According to KAGAKU KOGYO NIPPO of 14 March, the government had hoped to raise 1.5 billion yen from private (corporate and individual) donations but had collected only 170 million yen as of March. Therefore, instead of inviting 10 foreign researchers to participate in basic R&D at private firms, only two or three can be supported in fiscal year 1986. In the meantime, in the wake of strong criticism from home and abroad, the head of MITI's Agency for Industrial Science and Technology, Itaru Todoroki, is heading a stepped-up subscription drive.



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FOR OFFICIAL USE ONLY**JAPAN: AUTOMOBILE PARTS MANUFACTURERS MOVING
TO LOCATE PLANTS IN THE UNITED STATES**

Key Points: Japanese auto parts manufacturers fear they will lose their business in the U.S. market to U.S. competitors. The price of U.S.-manufactured parts is becoming competitive with auto parts from Japan because of the high value of the yen against the dollar. Automakers in the United States, including Japanese companies, are shifting parts purchases to U.S. manufacturers. In addition, Japanese parts manufacturers are under increasing pressure from domestic Japanese automakers to cut prices in order to counter the rising price of Japanese cars on the U.S. market.

Recent Tokyo press reports, including NIKKEI SANGYO SHIMBUN of 11 March, indicate that Japanese parts manufacturers are increasingly encouraged to locate their production in the United States. Japanese auto parts manufacturers fear that their products are losing cost-competitiveness in the U.S. market because of the high value of the yen against the dollar. They also fear the resulting loss of business to U.S. competitors. The press indicates that, at an exchange rate of 180 yen per dollar, U.S.-made parts are no more than 10 percent higher in price than those manufactured in Japan and shipped to the United States. Were the yen to become stronger, the price of U.S.-made parts would become lower in price than Japanese products.

It has been widely reported that major Japanese automakers including Toyota, Nissan, Honda, Mazda, Mitsubishi, and Fuji Heavy Industries (the manufacturer of Subaru) have either started or announced plans to produce cars in the United States. Together their production will total almost 1.5 million units by 1988. NIKKEI SANGYO SHIMBUN of 25 March points out that those Japanese automakers already in production in the United States are now planning to increase the use of U.S.-manufactured parts in their cars because of lower prices. NIKKEI SANGYO SHIMBUN of 11 March reports that Nissan and Honda have directed their U.S. production plants to increase the number of U.S.-made parts used in their cars. U.S. automakers, including GM, are slowing purchases of parts made in Japan and are planning to increase purchases of U.S.-made parts.

In addition, the Tokyo press, including NIHON KEIZAI SHIMBUN of 24 March, reports that Japanese parts manufacturers are also faced with a drastic reduction in profits from the domestic market. Japanese automakers have recently asked auto parts manufacturers to make unusually large price cuts. According to NIKKEI SANGYO SHIMBUN of 25 March, Mitsubishi and Mazda have asked for an 8-10 percent cut, Honda a 2-10 percent cut, and Nissan a 2-3 percent cut. The press indicates that automakers negotiate with parts manufacturers on price every six months. They have traditionally asked for about an average 1.5 percent price cut at each session and have settled on an average cut of 0.5 percent. The press says that the date of the negotiation depends on when the company files its annual financial report. Mitsubishi, Mazda, Honda, and Nissan, which make up their financial reports in March, have negotiation sessions in April and in October.

The leading Japanese automaker Toyota, which files its annual report in June, according to NIKKEI SANGYO SHIMBUN of 25 March conducted its most recent price negotiation session in January 1986. As of January, the press reports that the company had not yet felt strongly the negative effects of the exchange rate differential and, therefore, had asked no more than the traditional rate cut of 1.5 percent. The same source reports, however, that the company is now thinking about proposing a large price cut in its July negotiating session. If an exchange rate of 170 yen per dollar continues, Mitsubishi, Mazda, Honda, and Nissan will again demand another drastic price cut in their October negotiating sessions.

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According to the press, Japanese automakers are trying to reduce production costs by imposing a large price cut on parts manufacturers. They fear that a third price hike would slow down their growth in the U.S. market. NIHON KEIZAI SHIMBUN of 5 April and NIKKAN KOGYO SHIMBUN of 18 March report that Japanese automakers have raised their prices twice in the past six months to compensate for the increasingly high value of the yen against the dollar. They raised prices by about 3-4 percent for the first time in December 1985-January 1986, followed by a second hike in March of 3-4 percent. Since the yen has increased its value against the dollar by more than 40 percent in the past six months, these price increases—which total 7-10 percent—do not fully compensate automakers for the decline in the value of the dollar.

As NIHON KEIZAI SHIMBUN of 5 April reports, Japanese automobiles have lost their once-strong cost-competitiveness on the U.S. market. Because of the two price increases, according to NIKKAN KOGYO SHIMBUN of 18 March, the stripped-down version of a Nissan Sentra now costs almost \$1,000 more than the South Korean competitor Pony Excel. The press says that Japanese auto manufacturers did not approach the FY85 export quotas to the U.S. because of high prices and a slowdown in the U.S. auto market in February and March. The Japanese Government has imposed voluntary export quotas since 1981. The export quota for FY85 was set at 2.41 million cars, but total exports to the U.S. for FY85 remained at 2.286 million cars (passenger cars and vans), 124,000 short of the quota figure.

According to NIKKEI SANGYO SHIMBUN of 11 March, Japanese auto parts manufacturers have decided that, in order to survive this crisis, they have no choice but to establish plants in the United States. NIKKEI SANGYO SHIMBUN of 11 March and NIKKAN KOGYO SHIMBUN of 4 January indicate that 22 major Japanese auto parts manufacturers have already or will establish U.S. production plants. As of January, according to NIKKAN KOGYO SHIMBUN of 4 January, 15 Japanese auto parts makers have established U.S. production plants, 16 have formed joint ventures, 13 are examining the possibility of starting U.S. production, and eight are providing production technology to U.S. manufacturers. NIKKEI SANGYO SHIMBUN of 11 March and NIKKAN KOGYO SHIMBUN of 18 February report that an additional 16 parts manufacturers affiliated with Mitsubishi have decided to start U.S. production, probably by forming a joint venture with Chrysler's Component Business Division. NIKKEI SANGYO SHIMBUN also reports that Mazda-affiliated parts manufacturers will also decide this year on whether to begin production in the U.S.

(A translation of the sources cited in this article will appear in JAPAN REPORT: SCIENCE AND TECHNOLOGY.)



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S&T CONFERENCES

Selected international S&T conferences will be highlighted in PERSPECTIVES as information becomes available.

The World Congress on High-Tech Ceramics will be held from 23 to 28 June in Milan. The congress is designed as a forum to present national research projects and plans for high-tech ceramics in the more advanced industrial countries; to discuss strategies for high technology applications and to examine critical limiting factors; and to assess the impact of advanced ceramics on key industrial sectors (e.g. high temperature engineering, process engineering, electronics-space technology, and biotechnology).

Researchers from corporate and government centers in the U.S., Japan, France, West Germany, Italy, the USSR, and other countries will present papers in the fields of electrical engineering, electronics, electro-optics, telecommunications, heat engines, process engineering, metal cutting, and biotechnology.

For details on scheduled lecturers and papers, please contact

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EUROPE REPORT: SCIENCE AND TECHNOLOGY

ADVANCED MATERIALS

AEROSPATIALE LABS WORK ON METALLIC, NONMETALLIC MATERIALS

Chatillon, Gatines labs improve tactical missile materials: steel alloys, aluminum alloys, metal-matrix composites, glass, carbon fibers. (Paris AIR & COSMOS 15 Mar 86 p 24)

RESEARCH ON VACUUM PROCESSING OF SUPERCONDUCTORS

This article details practical research relating to how electromagnetic purity of three superconductive alloys is greatly enhanced by manufacturing processes in a vacuum. (Bologna VUOTO Oct-Dec 85 pp 243-250)

PIRELLI PATENTS NEW CABLE TECHNOLOGY (FIBER OPTICS)

Pirelli has patented a substance—Hydroget 1—capable of preventing hydrogen from attenuating signals sent through optical fibers. (Milan FATTI E NOTIZIE Feb 86 p 21)

AEROSPACE

OFTA (OFFICE OF FRENCH AEROSPACE TECHNOLOGY) COORDINATING FRENCH COMMERCIAL SPACE STRATEGY

Manufacture of products in microgravity viewed as commercial, not scientific, endeavor; first European products expected by end of 1988. (Paris SCIENCES & TECHNIQUES Mar 86)

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REVIEW OF FRG AEROSPACE ACTIVITIES, FRENCH-FRG COOPERATION

Interview with FRG industry official; ONERA, MBB, Dornier wing development, wind tunnel studies; MBB, Aerospatiale, Airbus; CAD/CAM data exchange; MTU-Turbomeca engines. (Paris AIR & COSMOS 22 Mar 86)

COMPUTERS

BULL'S ISIS SUPERCOMPUTER IN FINAL CONSTRUCTION STAGE

First prototype to function end of this year; software installed by mid-1987; architecture described. (Paris ZERO UN INFORMATIQUE 17 Mar 86)

GERMAN PARALLEL COMPUTER TX2 READIED FOR MARKET 1987

University of Karlsruhe spin-off development; comparable to Cray, IBM, Control Data; tree-structure architecture; funding by venture capital, research ministry; commercial applications planned. (Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT 25 Mar 86 p 5)

SIEMENS SUPERCOMPUTER DEVELOPMENT DEPENDS ON JAPANESE R&D

IBM copyright issue; cooperation with Fujitsu, Hitachi, Mitsubishi, Toshiba, NEC; series 7800; "suprenum"; no funds from Bonn. (Hamburg DIE ZEIT 25 Mar 86 pp 25-26)

LASERS, SENSORS & OPTICS

LASER APPLICATIONS IN GDR, OTHER COUNTRIES

Development of laser technology in the GDR and other countries is discussed in the light of patent literature; a laser specialist discusses achievements and plans in this field. (East Berlin TECHNISCHE GEMEINSCHAFT No 3, 86 pp 13-14)

MICROELECTRONICS

UK TRANSPUTER FIRM MAY SELL HALF OF ASSETS TO MATSUSHITA

Thorn-EMI Inmos losses; searching for two or three partners; transputer makes fifth generation computers possible. (Frankfurt/Main FINANCIAL TIMES 1 Apr 86 p 18)

SIEMENS-TOSHIBA CMOS CELL LIBRARY

Accelerates 1-megabit computer development; user-specific cell library with applications in automation, universal computers, heavy transportation electronics; Venus design; 1984/85 strong growth, 1986 expected to show losses; other partners possible. (Duesseldorf HANDELSBLATT 17 Mar 86 p 21)

FRG INSTITUTES STUDY INTELLIGENT 'ORMOSILE' APPLICATIONS

First organically modified silicates ready for production; industrial chemical sensor applications. (Hamburg DIE ZEIT 7 Mar 86 p 100)

TECHNOLOGY TRANSFER

FRENCH VLSI TECHNOLOGY TO CHINA

Contract worth Fr 500 million; integrates Brazil CAM software; 30 prototypes annually. (Paris SCIENCES & TECHNIQUES Apr 86 p 6)

EC, FRG, SWEDEN REACT TO COCOM EMBARGO RULES, CONTROLS

Revised embargo lists, exceptions; military, political considerations. (Stockholm NY TEKNIK 6 Mar 86 pp 6, 16-17, 19, 20)

FRENCH, LUXEMBOURG COMPANIES IN COURT FOR EMBARGO VIOLATIONS

Semiconductor export; civilian, military use; Air France involved. (Luxembourg LUXEMBURGER WORT 15 Mar 86 p 3)

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USSR REPORT: CYBERNETICS, COMPUTERS AND AUTOMATION TECHNOLOGY

'ELEKTRONIKA BK-0100' COMPUTER DESCRIBED

The computer, a product of the Ministry of the Electronics Industry, is a "home" computer. It is also intended for school use. (Moscow IZVESTIYA 24 Mar 86 p 1)

'ELEKTRONIKA-60' - BASIS FOR AUTOMATED OPERATION AT URENGOY GAS FIELDS

Use of the "Elektronika-60" at the UKTG-IAS and UKTG-2B compressor stations has resulted in a savings of 2.7 million rubles per year. (Moscow GAZOVAYA PROMYSHLENNOST No 3, Mar 86 p 16)

COMPUTER APPLIED IN LIVESTOCK BREEDING

Computerized livestock breeding is detailed with diagrams, flowcharts, and formulas. (Moscow ZHIVOTNOVODSTVO No 2, Feb 86 pp 16-18)

COMPUTERIZATION IN UZBEK SSR DISCUSSED

Although Uzbek SSR has 131 computer centers, involving at least 1,000 personnel and expenditure of over 180 million rubles, there are still serious problems to face in implementing computerization. (Tashkent EKONOMIKA I ZHIZN No 1, Jan 86 pp 18-21)

USSR REPORT: ENGINEERING AND EQUIPMENT

TRENDS, STATISTICS FOR COAL EXTRACTION TECHNOLOGY VIEWED

A statistical overview of current coal extraction and conveying equipment is presented. Applications, utilization rates of major capital equipment are discussed for 22 mining enterprises. (Kiev UGOL UKRAINY Mar 86 pp 22-24)

MODULAR CONSTRUCTION OF COMPRESSOR STATIONS DESCRIBED

Modular construction of compressor stations is claimed to save as much as 4 million rubles per unit. Standardization and shorter construction cycles are cited as other advantages. (Moscow GAZOVAYA PROMYSHLENNOST No 3, Mar 86 p 17)

DECENTRALIZATION OF ASUTP SYSTEMS PLANNED IN GAS INDUSTRY

An industry official discusses the trend to make automated plant and technology management systems more responsive to local requirements of the natural gas industry. (Moscow GAZOVAYA PROMYSHLENNOST Mar 86 pp 40-41)

USSR REPORT: MACHINE TOOLS AND METALWORKING EQUIPMENT

MODERNIZED OIL DRILLING EQUIPMENT MANUFACTURING PLANT VIEWED

The director of an R&D and experimental oil drilling equipment production facility states that the TRM-195 turbo drill is being readied for series production. (Moscow NEFTYANIK Mar 86 pp 2-3)

USSR REPORT: SCIENCE AND TECHNOLOGY POLICY

NEW DISCOVERY IN GAS DYNAMICS REGISTERED

The discovery in gas dynamics by scientists of the Moscow Aviation Institute im. Ordzhonikidze will be applicable in jet engines, gas turbine plants, and several types of industrial ejectors. (Moscow SOTSIALISTICHESKAYA INDUSTRIYA 21 Mar 86 p 2)

BIOGRAPHIES OF SOVIET SCIENTISTS APPEARING IN 'NAUKA I CHELOVECHESTVO 1985'

Biographies of major Soviet scientists published in the 1985 "Yearbook: Science and Man." (Moscow NAUKA I CHELOVECHESTVO 1985)

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